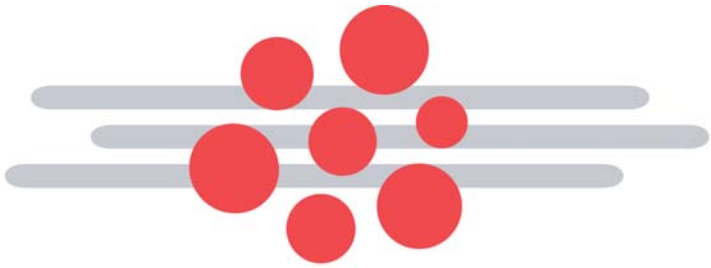
# Environment, Safety, Security and Health Plan for the Construction of CFN Conventional Facilities



Center for Functional Nanomaterials
Brookhaven National Laboratory

**Project No. 05-R-321**
**October 2005**
**Revision 2**

## BNL Center for Functional Nanomaterials

**Basic Energy Sciences**

# Environment, Safety, Security and Health Plan for the Construction of CFN Conventional Facilities

**At**

## Brookhaven National Laboratory (BNL)
**Upton, New York**

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**Basic Energy Sciences**

**October 2005**

BROOKHAVEN NATIONAL LABORATORY

Center for Functional Nanomaterials
Brookhaven National Laboratory

# Environment, Safety, Security and Health Plan for the Construction of CFN Conventional Facilities Change Log

| Revision No. | Date | Reason |
|---|---|---|
| 0 | April 2005 | New |
| 1 | August 2005 | Management Reorganization |
| 2 | October 2005 | Update Procedures/Mgmt Reorg./Modified Emergency Call down procedure |

## Glossary of Document Acronyms and Abbreviations

| | |
|---|---|
| A/E | Architect/Engineer |
| AHA | Activity Hazard Analysis |
| ALARA | As Low as Reasonably Achievable |
| BES | Basic Energy Sciences |
| BHSO | Brookhaven Site Office |
| BNL | Brookhaven National Laboratory |
| BSA | Brookhaven Science Associates |
| CDR | Conceptual Design Report |
| CCDM | Conventional Construction Design Manager |
| CCM | Conventional Construction Manager |
| CEGPA | Community, Education, Government and Public Affairs |
| CFR | Code of Federal Regulations |
| CFN | Center for Functional Nanomaterials |
| CR | Construction Field Representative |
| CSE | Construction Safety Engineer (RSB/CFN) |
| CVO | Contractor Vendor Orientation |
| DART | Days Away Restricted or Transfer |
| DEC | Department of Environmental Conservation |
| DOE | Department of Energy |
| EC&S | Engineering and Construction Services |
| ECSM | Engineering and Construction Services Manager |
| ESH | Environment, Safety and Health |
| ESSH&Q | Environment, Safety, Security, Health & Quality |
| ESHCSE | Environment Safety & Health Construction Safety Engineer |
| ECN | Engineering Change Notice |
| EMR | Experience Modification Rates |
| EPA | Environmental Protection Agency |
| EP | Plant Engineering |
| EP O&M | Plant Engineering Operations and Maintenance |
| FPD | BHSO Federal Project Director |
| FY | Fiscal Year |
| HASP | Health and Safety Plan |
| HQ | Headquarters |

| | |
|---|---|
| IO&A | Independent Oversight and Assessment |
| IPT | Integrated Project Team |
| JSA | Job Safety Analysis |
| ISM | Integrated Safety Management |
| LEED | Leadership in Energy and Environmental Design |
| M&O | Management & Operations |
| NEPA | National Environmental Policy Act |
| NTP | Notice to Proceed |
| O&M | Operations and Maintenance |
| OMB | Office of Management and Budget |
| ORE | Operational Readiness Evaluation |
| PBMC | Performance Based Management Contract |
| PED | Project Engineering & Design |
| PEP | Project Execution Plan |
| PPM | Procurement & Property Management |
| PQAP | Project Quality Assurance Program |
| PSAR | Preliminary Safety Analysis Report |
| QAP | Quality Assurance Program |
| QC | Quality Control |
| QMS | Quality Management System |
| Rep | Representative |
| R2A2 | Roles, Responsibilities, Accountabilities and Authorities |
| RSB | Research Support Building |
| SAE | Secretarial Acquisition Executive |
| SBMS | Standards-Based Management System |
| SC | DOE Office of Science |
| SHSD | Safety and Health Services Division |
| SME | Subject Matter Expert (SBMS) |
| SOP | Standard Operating Procedure |
| TCR | Total Case Rate |
| TEC | Total Estimated Cost |
| TPC | Total Project Cost |
| WBS | Work Breakdown Structure |

# Table of Contents

## 1. EXECUTIVE SUMMARY

The conventional construction of the CFN will be conducted in the safest manner possible and be a model for construction of future facilities at BNL. This document was developed to assure that the following critical aspects are well documented and understood by BNL, DOE and contractor personnel associated with the CFN project.

- Safety is the highest priority for the CFN conventional construction
- Safety responsibilities of key personnel are clearly delineated
- All personnel involved in conventional construction will uphold the ESSH&Q vision and policy.
- All BNL applicable SBMS rules, DOE Orders and external regulatory rules will be followed.
- There will be frequent and open communication between the Integrated Project Team (IPT) staff, contractors and regulators (contractor briefings, weekly project meetings, and periodic oversight meetings).
- Daily Safety Inspections will be performed, documented and issues promptly corrected.
- Any incident, accident or other abnormal event will be properly communicated via established procedures.
- All personnel have stop work authority (contractor, DOE and BNL staff).

## 2. INTRODUCTION

The safety of all personnel is recognized as a primary concern to all staff, guests, contractors and vendors at Brookhaven National Laboratory and the Center for Functional Nanomaterials. Unsafe conditions and unsafe behavior can result in

injuries and deaths as well as impact schedules, cause financial losses, and damage equipment. As such, it is our goal that all Project participants plan, manage, and execute their respective operations with the ultimate goal of conducting their operations injury-free on a daily basis.

Brookhaven National lab exemplified it's commitment to safety and the environment with its registration to the ISO 14001 Environmental Management System and its ongoing registration to the OHSAS 18001 Safety Management System. Each system is routinely audited to ensure BNL and their contractors meet the commitments identified in its Environmental, Safety, Security and Health (ESSH) policy.

The Plant Engineering Construction Safety Program was one of the first programs to be registered to the 18001 Safety Management System during the pilot phase rollout in 2004. The 18001 program embellishes the ISM processes and puts emphasis on the risk analysis of hazardous operations.

The Integrated Safety Management System (ISMS) shall be used to achieve these goals. The ISMS is a practical approach to the prevention of accidents with an emphasis on line management responsibility for safely. A central premise is that work planning starts with a focus on the nature of the job to be performed and assessment of the hazards involved in each step. Through the use of self-assessment and feedback, continuous improvement in each subcontractors' safety process is expected. The conventional construction phases of the CFN as they relate to ISM are shown in Figure 1.

It is the responsibility of the CFN Construction Prime Contractor to adhere to the requirements of this plan. The CFN Construction Prime Contractor shall incorporate safety into the planning of each task, assure the safety of their personnel, provide all personal protective equipment necessary for their employees, establish a safe and drug free work environment, and confirm that their equipment meets the applicable safety standards. The CFN Construction Prime Contractor is responsible for any actions of their personnel that may endanger or otherwise expose other participants to potential hazards on the project.

Project participants are required to supervise and direct the work, using their best management skills and technical expertise. The CFN Construction Prime Contractor will be solely responsible for all construction means, methods, techniques, sequences and procedures. This includes all safety precautions and programs in connection with the work, as well as coordinating all portions of the work. Each lower-tier sub-contractor is likewise required to be responsible for all safety precautions and programs in connection with the work under the prime's contractual agreement.

All personnel on the Project have **stop work** (Imminent Danger Procedures) authority for any task that represents an imminent threat to safety, health and the environment. Only the CFN Project Director, with the concurrence of the ESSH&Q Coordinator, can authorize a restart of the identified task.

The CFN Construction Prime Contractor will submit to the BNL ESH CSE a written Health and Safety Plan (HASP) in compliance with the project requirements for review and approval. This safety plan will meet or exceed all applicable Project safety requirements and must comprehensively address all anticipated hazards for executing the construction and identify the appropriate protective measures that will be used to mitigate the hazards. All sub-contractors to the prime must follow the requirements in the prime's HASP.

### 2.1 Applicability and Scope

This plan documents how the CFN project will manage environmental protection, worker safety, security and health, and quality (ESSH&Q) aspects of activities carried out within section 1.3 of the CFN Work Breakdown Structure (WBS) for conventional construction. It applies to facility design and the activities of the prime contractor and subcontractors engaged in the construction of the CFN building in addition to the BNL construction support staff. It does not cover the installation of technical equipment, commissioning or operations.

## 2.2 Purpose

This plan has been formulated to ensure that construction of the conventional facilities of the CFN address foreseeable ESSH&Q risks in a manner consistent with:

- DOE Orders,
- Recognized standards,
- BNL ESSH&Q Vision and Policy,
- Directions from the BHSO Federal Project Director and the Manager of DOE's Brookhaven Site Office (BHSO),
- CFN goals, and
- Additional concerns that BNL personnel identify during the construction, use and maintenance of the building

This plan is intended to be consistent with other BNL and Project documents defining the CFN project including the Construction Safety Subject Area, CFN Project Execution Plan, Risk Management Plan, Project schedule etc. and is not intended to supercede those documents. It is to be used as a supplemental document with respect to construction safety.

This plan is designed to provide a "roadmap" of the pertinent construction program elements that impact ESSH&Q and to assure that all personnel with construction safety responsibilities are clearly identified and those responsibilities are understood.

# 3. BNL ESSH&Q VISION AND POLICY

The CFN is committed to incorporate the BNL ESSH&Q Vision and Policy in all aspects of the design, construction and operations of the facility.

### 3.1 ESSH&Q Vision

The entire BNL community will establish and sustain an injury-free, healthy, secure and safe workplace for all employees, visitors, and contractors. In fulfilling this vision we are committed to:

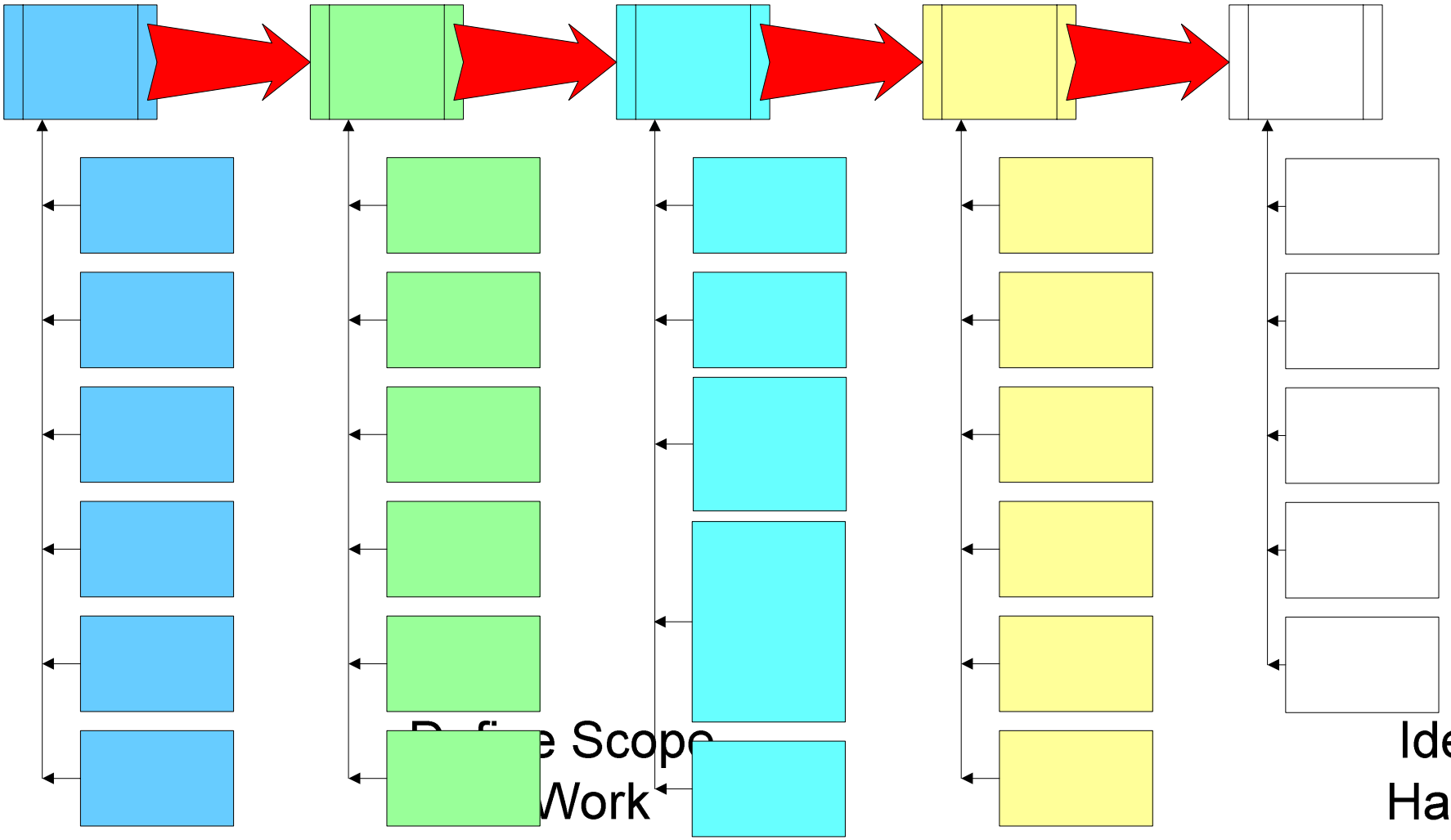
- Implement, and evaluate the Occupational Safety and Health (OSH) programs.
- Communicate requirements through SBMS to comply with applicable Federal, State, and County Regulations.
- Work within the framework of Integrated Safety Management (ISM).
- Establish goals and performance indicators to guide these efforts and measure performance and progress.
- Continually improve our OSH program and our performance.

### 3.2 Environmental, Safety, Security, and Health Policy

This policy is consistent with BNL's research interests, ethics, and shared values. We commit to continual improvement in environmental, safety, security, and health (ESSH&Q) performance. We will set goals, measure progress, and communicate results. Compliance with this policy is the responsibility of every employee, contractor, and guest. Specifically, we commit to the following:

- **Employees, Contractors and Guests:** We will provide a safe, secure and healthy workplace, striving to prevent injuries and illnesses, promoting healthy lifestyles, and encouraging respect for the environment. We will ensure our employees, contractors, and guests have the awareness, skills, and knowledge to carry out this policy.
- **Compliance:** We will meet all applicable ESSH&Q laws and BNL Standards Based Management System, Integrated Safety Management, and Integrated Safeguards and Security Management requirements.

- **Integration:** We will integrate ESSH&Q principles into our research and operations activities. We will integrate hazard prevention/reduction, pollution prevention/waste minimization, resource conservation, security, and compliance into all of our planning and decision-making. We will adopt cost-effective practices that eliminate, minimize, or mitigate environmental impacts and control safety, security, and health risks and vulnerabilities.
- **Security:** We will work in compliance with DOE's ISSM Program and systematically integrate safeguards and security into management and work practices at all levels, so that the laboratory missions are accomplished in a safe and secure manner.
- **Sustainable Development:** We will strive to conserve resources and minimize or eliminate adverse ESH effects and risks that may be associated with our research and operations. We will manage our programs in a manner that protects the ecosystem and employee/public health.
- **Stakeholders:** We will work with our stakeholders to help them address their ESSH&Q needs. We will maintain a positive, proactive, and constructive relationship with our neighbors in the community, regulators, DOE, and our other stakeholders. We will openly communicate with stakeholders on our progress and performance.
- **Community and Government:** We will participate in community and government ESSH&Q initiatives. We will define, prioritize, and aggressively prevent, correct, and/or clean up existing environmental, security, and occupational safety and health problems.


Identify
Hazards

## 4. ORGANIZATIONAL STRUCTURE (FIGURE 2)

### 4.1 Program Responsibility Related to Construction Safety

#### 4.1.1 DOE SC-22 Office of Basic Energy Sciences

Within SC, the Office of Basic Energy Sciences (SC-22) is the DOE/HQ organization that has programmatic responsibility for the CFN project, and the Associate Director for Basic Energy Sciences is the Acquisition Executive (AE). The Office of Project Assessment (SC-1.3) advises the AE on project issues.

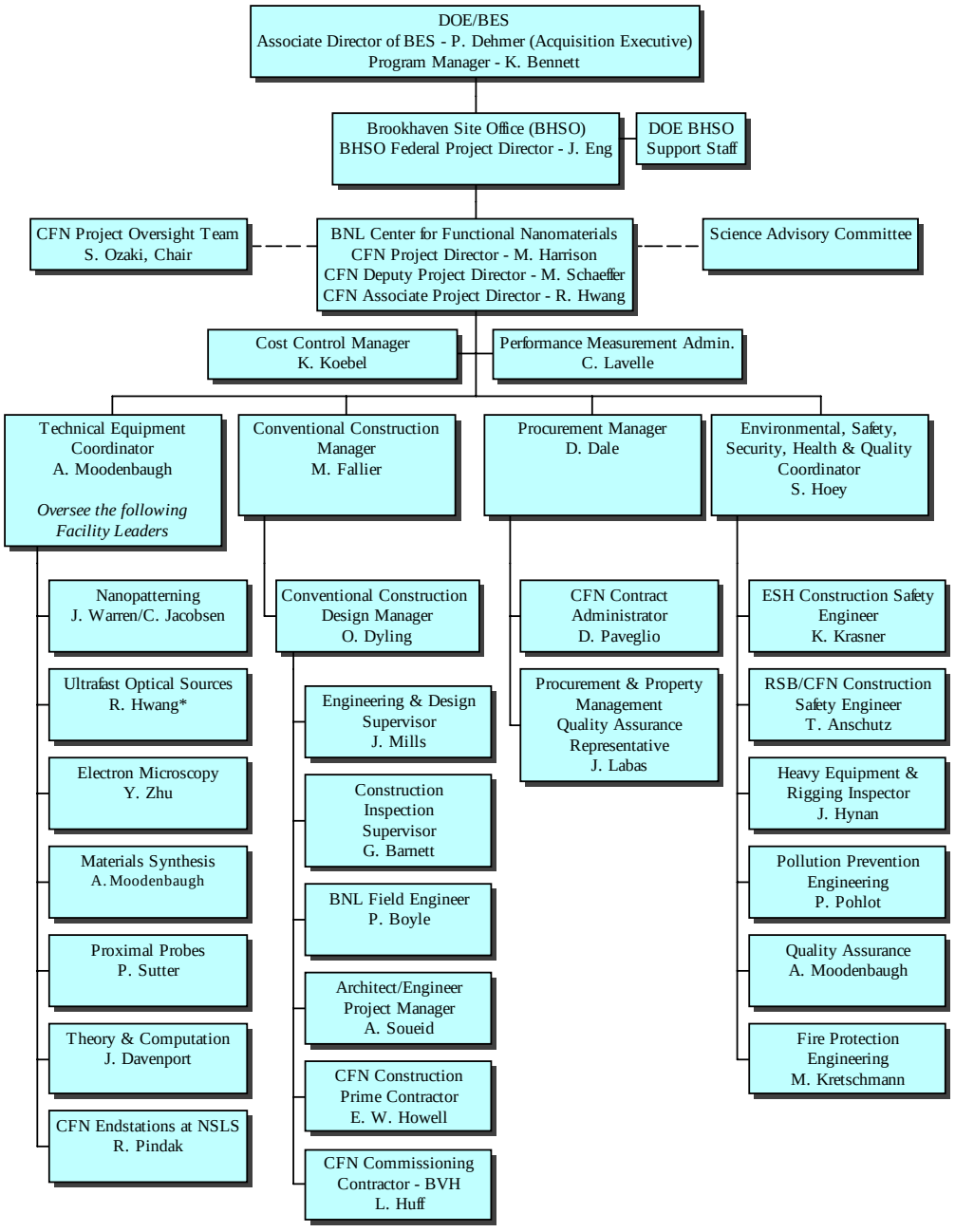
#### 4.1.2 DOE – Brookhaven Site Office (BHSO)

The DOE/BHSO office will provide Federal oversight for execution of the project to include legal, contracting, environmental and project management. The BHSO Federal Project Director has official federal responsibility and accountability for the overall success of the project. This includes overall oversight and direction of the construction safety program and communication of safety performance to DOE SC-22.

### 4.2 CFN Line Management Responsibility

ESSH&Q functions are the responsibility of the line organizations at the Laboratory. The CFN line organization is responsible for planning, review, and surveillance of health physics, industrial hygiene, As-Low-As-Reasonably-Achievable (ALARA), fire protection, industrial/occupational safety, and environmental aspects of the CFN project's technical baseline. To effectively carry out these responsibilities, the CFN will have ESH staff dedicated to the project and draw support of ESSH&Q specialists employed in other line organizations including Plant Engineering (EP) and the ESSH&Q Directorate (ESSH&Q) as well as outside contractors. Examples of support include:

# Figure 2
# Center for Functional Nanomaterials (CFN)
# Project Organization




*Acting

- Technical assistance during the conduct of an ESSH&Q baseline survey (PE-500A form) consistent with the scope and intent of the one described in the *Construction Safety Subject Area*
- Review and comment on contractors' ESSH&Q programs and implementation plans
- Conduct of Contractor Vendor Orientation (Course HP-Q-006) and, if required, General Employee Radiation Training (Course HP- RWT-001); and
- Supplementary construction safety oversight in addition to dedicated CFN ESSH&Q staff

CFN line management is also responsible for cooperating with independent oversight of ESSH&Q aspects of CFN construction activities.

### 4.2.1 Associate Laboratory Director for Basic Energy Sciences

The ALD for BES has the following responsibilities relating to CFN construction and operational safety: 1) Oversees the ESSH&Q performance of the CFN and the other BES organizational units to ensure that operation and work is compliant with DOE, State of New York, Suffolk County Laws and regulations, and BNL procedures, policies, and applicable Facility Use Agreements, 2) Maintains contacts with DOE science managers of relevant facility programs for funding, scientific programs, ESSH&Q performance and operations, and 3) has budget authority for operations of the experimental programs of all BES funded facilities

### 4.2.2 CFN Project Director (PD)

The CFN Project Director has full responsibility and authority for carrying out the CFN project in a manner consistent with this ESSH&Q Construction Safety Plan and other project plans. The CFN Project Director has the continuing responsibility to develop participation and commitment from the outside research community as

well guide the design and construction of the CFN to accommodate the requirements of the researchers including overall ESSH&Q responsibilities. The CFN Project Director is responsible for the CFN user outreach programs and future transition to the operations of the new facility. The CFN Project Director reports to DOE/BES through the BHSO Federal Project Director.

### 4.2.3 CFN Deputy Project Director (DPD)

In addition to the responsibility to implement management methods to achieve CFN scope, cost and schedule objectives, the CFN Deputy Project Director directly supports the CFN Project Director to achieve the CFN project's ESSH&Q objectives. To achieve the ESSH&Q objectives he will:

- Hold the contractor responsible and accountable for successful execution of contractor's project scope of work including ESSH&Q & quality objectives
- Review and approve ESSH&Q staffing and planning decisions for the CFN IPT
- Participate in regular contractor progress meetings to review ESSH&Q performance
- Participate in periodic ESSH&Q inspections of the CFN construction site to verify contractor performance
- Communicate accurate and reliable project ESSH&Q status and performance issues to DOE management
- Identify and manage project ESSH&Q risks
- Work within the framework of Integrated Safety Management (ISM)
- Ensure effective implementation of CFN ESSH&Q Conventional Construction Safety Plan by CFN IPT staff
- Review and approve Project safety analysis
- Verify receipt of all required environmental evaluations and permits

- Coordinate reviews for final acceptance of project facilities and occupancy permit documentation

### 4.2.4 Environmental, Safety, Security, Health & Quality Coordinator

The ESSH&Q Coordinator is responsible for implementing the BNL Integrated Safety Management (ISM) program for the CFN project to assure that environmental, safety, security and health issues are addressed in the design, construction, and ultimate operations of the CFN. The ESSH&Q Coordinator is the single-point-of-contact for the Occurrence Reporting and Processing System (ORPS). The ESSH&Q Coordinator will interact with the Integrated Project Team and manage as indicated in Figure 2. In this capacity, the ESSH&Q Coordinator will:

- Report to the CFN Project Director or his designee
- Oversee preparation of Hazards Analyses and insure that the facility design addresses identified hazards wherever feasible
- Utilize appropriate BNL ESSH&Q subject matter experts to prepare hazard analyses, review design documents and oversee construction activity to assure compliance with ESSH&Q standards
- Oversee implementation of construction safety program to assure compliance with BNL and OSHA regulations and monitor progress toward the zero injury goal
- Be responsible for internal oversight and evaluations of the implementation of the CFN construction safety program. The evaluations shall address consistency with defined expectations, i.e., conformance to internal procedures, as well as identification of hazards not effectively addressed by the program

- Oversee performance of beneficial occupancy and operational readiness evaluations of the CFN as required to enable timely operations in accordance with ESSH&Q requirements
- After an event, oversee and coordinate adherence to required procedures in reporting abnormal events or conditions following the BNL SBMS Subject Area Occurrence Reporting and Processing System (ORPS)
- Oversee development of a Project Quality Assurance Plan (PQAP)
- Serve as the primary CFN interface with BNL ESSH&Q oversight personnel looking into construction-related ESSH&Q concerns and notify the PM of plans for DOE and other non-BNL safety and environmental protection oversight activities at the CFN construction site
- Support the implementation of a construction ESSH&Q program consistent with BNL expectations by 1) Identifying expectations and 2) Drafting a construction ESSH&Q plan for implementing those expectations

*Authority:* Independent of the CFN Project Director, the ESSH&Q Coordinator has the authority to:

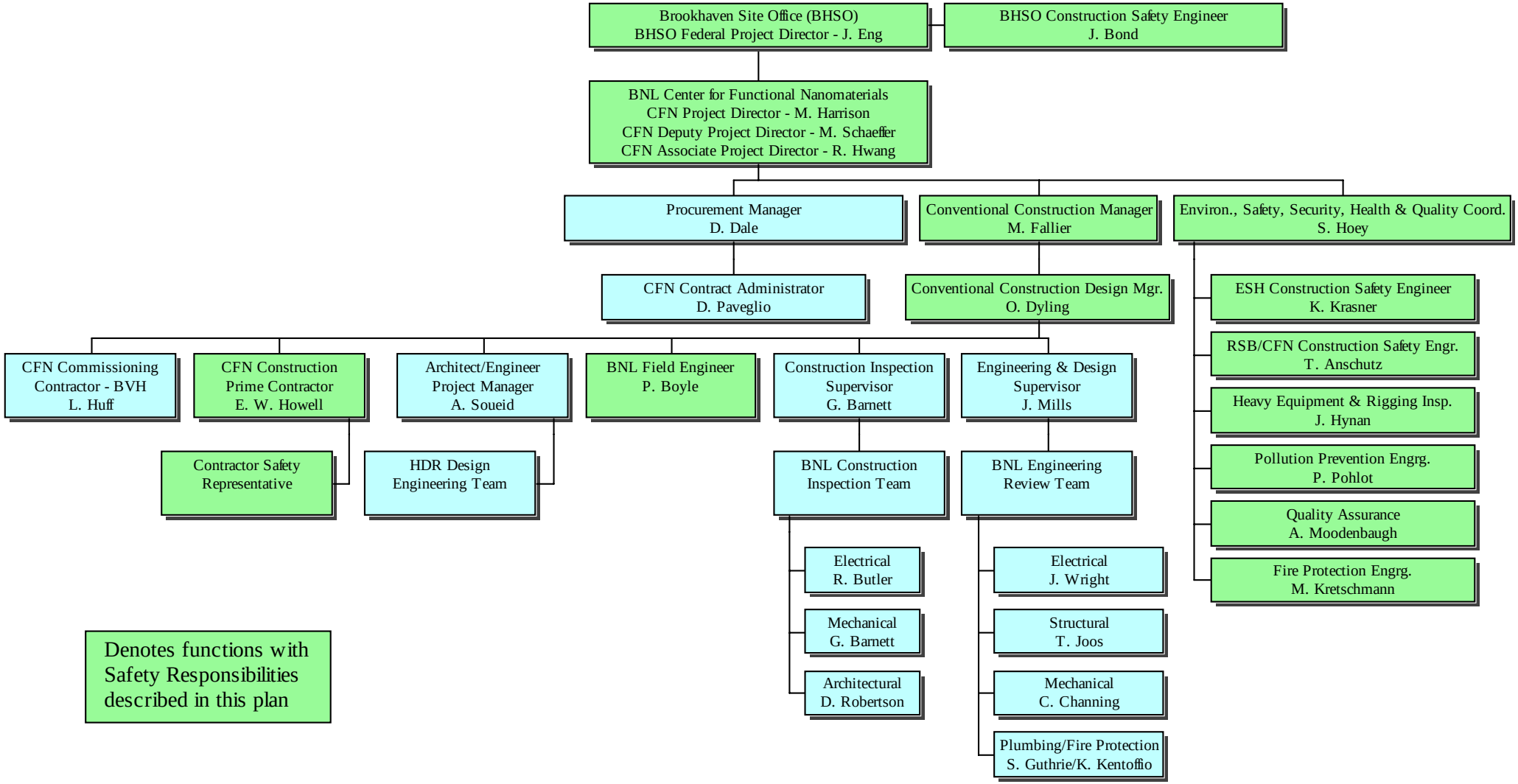
- Order the contractor and contractor employees to “stop work” when imminent dangers are present (as does any employee)
- Communicate concerns and offer constructive guidance directly to other CFN project personnel
- Report concerns that cannot otherwise be resolved to the CFN Deputy Project Director

### 4.3 CFN Conventional Construction Safety Organization

The purpose of the CFN Construction Safety Organization (Figure 3) is to ensure that construction activities are managed in compliance with applicable OSHA regulations, EPA requirements (Federal and state), DOE Orders, and BNL policies and procedures, including the Laboratory's *Integrated Safety Management Program Description.* It is concerned with the effective implementation of safe work practices, including preparing contractors for work at BNL and conducting work surveillance needed to verify that contractors are meeting the requirements for ESSH&Q. Figure 1. depicts the relationship of ISMS to CFN construction safety.

The Conventional Construction Safety Oversight Team reports to the ESSH&Q Coordinator and consists of subject matter experts responsible for maintaining construction safety. The ESH Construction Safety Engineer will review and approve contractor safety plans, consult on preparation and approval of specific work plans and permits, and conduct periodic inspections of the project to ensure compliance with BNL and OSHA standards and adherence to the approved Health and Safety Plan. It is anticipated that the CFN Construction Safety Engineer will also be the RSB CSE. The RSB/CFN CSE will perform daily jobsite inspections, monitor jobsite activities for OSHA compliance, document all safety infractions, and bring them to the attention of the contractor Safety Representative for prompt correction. The Heavy Equipment and Rigging Inspector will inspect all mechanical equipment on the jobsite, review and approve all rigging plans, and inspect rigging activities. The Pollution Prevention Engineer will receive and review applicable sections of contractor submittals and will conduct periodic observations of jobsite activities for verification of environmental compliance and progress toward pollution prevention goals and LEED certification.

**Figure 3**
**Center for Functional Nanomaterials (CFN)**
**Conventional Construction, Procurement and Safety Organization**



### 4.3.1 Conventional Construction Manager

The Conventional Construction Manager is directly responsible for scope, cost and schedule performance of conventional facility design and construction. The Conventional Construction will be managed as indicated in Figure 3. In this capacity, the Conventional Construction Manager will:

- Report to the CFN Project Director or his designee
- Manage the efforts of the A/E firm to perform Title I and Title II design and provide Title III design support during construction
- Administer the technical terms of the construction contracts and contracts with independent testing laboratories. Assure that all contractors and vendors for conventional facilities perform in accordance with the terms of their contracts and purchase orders, including ESSH&Q requirements
- Manage the BNL engineering staff review of A/E designs and coordination with BNL utilities, systems and design standards
- Manage the Title III construction management, inspection, quality assurance, testing and startup of conventional facilities
- Coordinate with the Technical Equipment Coordinator to assure technical equipment requirements are incorporated into conventional facility design
- Coordinate with ESSH&Q Coordinator to assure that all ESSH&Q regulations, permits and reviews are properly complied with and addressed in the design and construction of conventional facilities
- Work within the framework of Integrated Safety Management (ISM)

*Safety Responsibilities:* The Conventional Construction Manager is responsible for:

- Ensuring integration and consistent application of BNL standards
- Providing EP O&M with the opportunity to assess the operability, reliability, and maintainability of CFN project technical baselines and conventional facilities during the facility design and maintaining a record of EP O&M feedback
- Ensuring the preparation of an ESSH&Q construction plan (this document) consistent with the intent set forth above
- Monitoring the performance of the CFN construction ESSH&Q surveillance program, i.e., ensuring that the program sufficiently controls ESSH&Q risk and ensures conformance with ESSH&Q requirements as set forth in the CFN PSAR
- Correcting deficiencies in the performance of CFN construction activities, particularly those that constitute noncompliance with ESSH&Q provisions in contract documents or attachments to this plan
- Contacting the CFN Project Director or ESSH&Q Coordinator if uncertain about the significance of an ESSH&Q concern
- Ensuring that contract documents contain appropriate ESSH&Q specifications
- Stopping work that poses an imminent danger (immediate and serious threat) to the health or safety of people, property or the environment

*Authority:* The Conventional Construction Manager has the authority to:

- Order the contractor and contractor employees to “stop work” when an imminent danger is present and

- Require the contractor to correct deviations from the BNL-approved Construction Safety Plan and direct the work of the contractor as provided in the contract

### 4.3.2 RSB/CFN Construction Safety Engineer (CSE)

*Safety Responsibilities:* The RSB/CFN Construction Safety Engineer (CSE) is responsible for monitoring construction activities on a daily basis to ensure that the prime contractor (and subcontractors) work safely, work in conformance with their corporate safety plans and job safety analyses, and comply with BNL and OSHA safety requirements. The CSE reports to the ESSH&Q Coordinator and is matrixed to the Conventional Construction Manager. Responsibilities include:

- Stopping work that poses an imminent danger (immediate and serious threat) to the health or safety of people or the environment
- Verification that permits are issued prior to authorizing permit-required work
- Ensuring that contractors understand and adhere to all permit requirements
- Performing and documenting daily inspections of the worksite to verify compliance with contractors HASP and BNL and OSHA ESSH&Q requirements
- Communicating all inspection results, findings and concerns to the Conventional Construction Manager and ESSH&Q Coordinator
- Assisting and advising the Contractor in planning and promoting ESSH&Q activities to address the hazards identified in the HASP including tool box safety meetings, work plans, and other risk reduction activities

- Assisting others in the conduct of accident and near-miss investigations
- Identifying and documenting ESSH&Q violations, and verifying that corrective actions have been implemented before resumption of work

*Authority:* Independent of the ESSH&Q Coordinator, the CSE has the authority to:

- Order the contractor and contractor employees to “stop work” when an imminent danger is present
- Require the contractor to correct deviations from BNL approved Job Safety Analysis (JSA) hazard control requirements
- Evaluate and accept (approve) job safety/risk analyses

### 4.3.3 Heavy Equipment and Rigging Inspector

The Heavy Equipment and Rigging Inspector is responsible for verifying that heavy equipment is safe for use prior to being used on the BNL site. He is also responsible for reviewing rigging plans and inspecting all equipment used in rigging operations prior to use. The heavy equipment and rigging inspector will:

- Review and approve all lifting and rigging plans
- Inspect all rigging equipment prior to use and verify proper execution of rigging plans
- Inspect all heavy equipment including off-site inspection of over the road cranes
- Advise the Lifting Safety Committee on Critical Lifts

### 4.3.4 ESH Construction Safety Engineer

*Safety Responsibilities:* The ESH Construction Safety Engineer (ESH CSE) reports to the Manager of Safety and Health Services Division and advises the ESSH&Q Coordinator. The ESH CSE is responsible for evaluating the implementation of the CFN construction safety program. The evaluations shall address consistency with defined expectations, i.e., conformance to internal procedures, as well as identification of hazards not effectively addressed by the program. The evaluations will include bi-weekly joint safety inspections with CFN personnel and construction contractor and subcontractor personnel.

The ESH CSE is also responsible for identifying program requirements and reviewing and commenting on the CFN prime contractor's construction HASP to assure that it comprehensively addresses CFN construction hazards in accordance with OSHA and DOE/BNL requirements. The ESH CSE will act for (back up) the RSB/CFN CSE when that person is not available.

*Authority:* Without working through the ESSH&Q Coordinator, the ESH CSE has the authority to:

- Order the contractor and contractor employees to "stop work" when imminent dangers are present
- Communicate concerns and offer constructive guidance directly to the ESSH&Q Coordinator and the CFN Project Director. In addition, the ESH Construction Safety Engineer can offer constructive guidance to other CFN project personnel directly when confirming communications are sent to the ESSH&Q Coordinator
- Report concerns that cannot otherwise be resolved to the CFN Project Director

### 4.3.5 Pollution Prevention Coordinator and Environmental Compliance Representative

The Pollution Prevention Coordinator and/or Environmental Compliance Representative will receive and review applicable sections of contractor submittals and will conduct periodic inspections of jobsite activities for verification of environmental compliance and progress toward pollution prevention goals and LEED certification. Periodic inspections may include;

- Review of hazardous material storage and use practices
- Industrial and hazardous waste management practices
- Recycling efforts
- Use of environmentally preferable products

### 4.3.6 Quality Assurance

The CFN quality assurance engineer will provide oversight of the quality aspects of the project related to the procurement of equipment and the maintenance and implementation of the project quality assurance plan.

### 4.3.7 Fire Protection Engineer

The CFN fire protection engineer will oversee fire protection measures for the CFN project including any interim measures implemented during construction. He will utilize the BNL Fire Department staff for periodic surveillance of the construction site to assure that required protective measures are in place. The fire protection engineer will also review and approve designs, installation and final testing and certification of fire safety systems.

### 4.3.8 Conventional Construction Design Manager

The Conventional Construction Design Manager will coordinate the technical design requirements of the Facility Leaders, ESSH&Q design requirements and BNL's conventional facility design requirements with the A/E Project Manager to assure all

BNL design requirements are incorporated by the A/E firm. During construction, the CCDM will coordinate A/E field oversight, prime contractor and commissioning contractor activities, and in-house inspection and engineering review teams.

### 4.3.9 BNL Field Engineer

The BNL Field Engineer will be responsible for continuous day-to-day oversight of the prime contractor's activities. The BNL Field Engineer will have extensive construction experience including familiarity with OSHA construction safety regulations and will have received OSHA 30 hour construction safety training as a minimum. Oversight and responsibilities will include:

- Verification that construction is carried out in accordance with the plans and specifications
- Verification that the contractor is performing work in accordance with the approved HASP
- Coordination with contractor Superintendent, contractor Safety Representative and BNL organizations as required to secure permits and approvals needed to perform work
- Stop Work whenever there is imminent hazard to personnel, the environment or BNL facilities
- Preparation of daily field reports indicating contractor staffing levels, work planned and accomplished, notable communications or directions to the contractor, identified issues requiring decision or action, contractors compliance with HASP and OSHA/BNL/DOE requirements
- Consultation with BNL ESSH&Q SME's whenever there are safety issues or concerns
- Prompt communication with the CFN CDM when there are technical or safety performance issues

- Maintenance of a record of all project documents and submittals relating to the status of design and construction in the field
- Communication of approved design changes to the contractor and maintenance of a record of actual installation in the field

### 4.3.10 CFN Construction Prime Contractor

The CFN Construction Prime Contractor (E. W. Howell) will have responsibility for the safety of contractor and subcontractor personnel on the CFN construction site. The contractor must flow down all ESH requirements to all subcontractors. The contractor must prepare and carry out a HASP that identifies all anticipated hazards and identifies safety precautions to mitigate the hazards. The contractor must modify, with BNL approval, the HASP to address any changed conditions.

### 4.3.11 Contractor Safety Representative

The Contractor Safety Representative (E. W. Howell) is responsible for instituting the prime contractor's HASP throughout the life of the contract for all construction activities and for all subcontractors hired by the contractor. The Contractor Safety representative is responsible for:

- Verifying that all field work is performed in accordance with the approved HASP and OSHA, BNL/DOE regulations
- Proactively planning work so that hazard controls are ready and available on a timely basis to enable work to progress
- Communicating hazards to contractor and subcontractor employees
- Performing or verifying performance of weekly toolbox safety meetings
- Verifying appropriate permits are in place prior to commencing work
- Verifying that all contractor and subcontractor workers have appropriate training

- Maintaining and updating the approved HASP as conditions change, based on the most current identification of hazards and appropriate approved hazard controls
- Being present at the jobsite whenever work is underway or identifying an appropriately trained and qualified substitute when they are not at the jobsite

## 4.4 Project Oversight

### 4.4.1 CFN Project Management Team

The CFN Project Management Team is led by the CFN Project Director and includes the CFN Deputy Project Director, the CFN Associate Project Director, Technical Equipment Coordinator, Conventional Construction Manager, Procurement Manager, Environmental, Safety, Security, Health & Quality Coordinator, Cost Control Manager, and Performance Measurement Administrator. The team is responsible for the following:

- Assigning action items to appropriate team members and tracking the issue until completed
- Consulting with the CFN Project Oversight Team quarterly, and more often when approaching critical decisions
- Identifying, preparing, and managing documentation needed for successful management of the project
- Communicating issues identified during the design, construction and commissioning of the facility

### 4.4.2 CFN Project Oversight Team

The CFN Project Oversight Team (Figure 2) conducts quarterly, independent reviews of the BNL CFN project. The Team performs formal technical, cost, schedule, ESSH&Q and management reviews on a quarterly basis to assess

project progress, identify issues, and provide recommendations for improvement. The CFN project baseline (Project Data Sheet and CD-2 documentation) will be the reference documents for the reviews. Findings, conclusions, recommendations and action items from each review are formally documented in a written report that is provided to the Deputy Director for Science & Technology.

## 5. INDEPENDENT OVERSIGHT AND ASSESSMENT

BNL policy makes IO&A responsible for identifying ESSH&Q issues on Laboratory projects and ensuring compliance with the Laboratory's overall ESSH&Q programs through independent audits and assessments of project activities. The BNL Deputy Director for Operations has requested that IO&A perform surveillance of project activities related to construction safety for the CFN. The IO&A assessment leader will present findings and recommendations to the CFN Project Director, Conventional Construction Manager and ESSH&Q Coordinator.

The IO&A assessment of the CFN will be performed periodically for the duration of the project by an assessment team comprised of independent construction safety experts. This team includes members from DOE Office of ESH and a major construction liability insurer loss prevention expert.

### 5.1 Purpose

The IO&A is to evaluate the adequacy and effectiveness of construction safety and control process in the Plant Engineering (EP) Division using the assessment tools developed by BNL and the contractor to whom the bid was awarded and to observe whether or not work is implemented in conformance to BNL SBMS requirements, EP procedures, and the contractor’s Health and Safety Plan (HASP).

IO&A will establish a team consisting of the IO&A Manager and IO&A Assessor. In addition, IO&A will use subject matter experts in Construction Safety from BNL/SHSD, DOE, DOE contractors, and/or Liberty Mutual to assist in each phase of the assessment. The assessment team will first focus on the New Research Support Building and then Center for Functional Nanoscience.

### 5.2 Scope

The evaluation will encompass:

**Phase 1:**

- A review of the SBMS Construction Safety subject area,
- A review of EP procedures for conformance to SBMS construction safety requirements,
- An evaluation of the adequacy of flow down of DOE/BNL requirements in contract materials,
- A review process for developing and issuing call for proposals,
- A review process for consideration of contractor's previous performance in bid award,
- A review and evaluation of the contractor's HASP,

**Phase 2:**

- Observation of training provided to contractors,
- Observation of toolbox and/or tailgate meetings,
- Review of R2A2 and involvement of the OSHA "Competent Person",
- Review of the interface between contractor and BNL for ongoing safe and efficient deployment of the project, and

**Phase 3**:

- Observation of work-in-progress to verify compliance with the contractor's HASP,

## 6. PERMITS AND ENVIRONMENTAL SUBMITTALS

The CFN project has been reviewed for applicability of NEPA and has been determined to be categorically excluded (Determination dated 10/6/03). The project has been reviewed by environmental SME's and it has been determined that new NESHAPS and SPDES permits will not be required.

## 7. PROCEDURES

The CFN construction project shall meet all requirements of BNL Standards Based Management System (SBMS); ESSH&Q Standards, and all other codes and standards as specified in the Technical Specifications and the contract. In cases of conflict the standard providing the greater protection shall govern. The CFN Conventional Construction Manager will call on M&O and ESSH&Q personnel to provide support in the conduct of all work where required to do so by BNL policies and procedures.

### 7.1 ESSH&Q Baseline Surveys

All required ESSH&Q Baseline Surveys including the EP 500A Form and other necessary Industrial Hygiene personnel protection monitoring will be performed in accordance with BNL procedures. All baseline surveys will be documented in accordance with the SBMS records management subject area. Results will be promptly communicated to the Contractor Safety Representative to assure necessary actions.

### 7.2 Project Design Review

The CFN design has met the requirements of the BNL Engineering Design Subject Area including review by ESSH&Q SME's. During construction, the CFN construction management program will follow the procedures set forth in the Engineering Design *Subject Area* whenever additional design or modification is required to address field changes.

### 7.3 Pre-Bid Conference

A pre-bid conference will be held during the bidding period to assure that interested contractors are aware of BNL requirements with regard to construction safety, security and environmental protection. Any notable information communicated at this meeting will be presented to all interested bidders.

### 7.4 Contractor Selection Process

The method of procurement for the CFN is a GO/NO-GO type contract wherein contractors must meet predetermined qualification criteria in order to qualify to be awarded a contract. The lowest cost qualified bid will receive the award. The qualification criteria for the CFN include stringent safety performance requirements in addition to technical experience requirements. The successful prime contractor must have three years of recent construction safety performance that are better than the national average for their work category and have an insurance Experience Modification Rate (EMR) that is equal to or less than 1.0 (i.e. a better than average loss history). These enhanced safety criteria are also required of all subcontractors. The prime contractor must also demonstrate an effective corporate safety program and submit a comprehensive corporate safety plan for review as a prerequisite for award.

### 7.5 Construction Health and Safety Plan Evaluation

After award of the CFN contract to a contractor that has met all construction safety criteria, the contractor must submit a project-specific HASP for review by BNL ESSH&Q SME's. The ESH CSE has the primary responsibility for review and approval of the HASP. The HASP must comprehensively address all anticipated hazards of the project by providing a phased hazard analysis and identifying the means to be used to address each of these hazards during the project. It also identifies the contractor Safety Representative, responsible for

safety performance of all contractor activities and the various “competent persons” required by OSHA for various construction tasks.

The approved HASP then becomes a controlled document that forms the basis for the contractor’s execution of their on-site safety program. This document is modified and updated as new conditions arise or new hazards are identified. Modifications to the HASP are reviewed and approved by the ESH CSE and distributed to the Project Team.

### 7.6 Notice to Proceed

A Notice to Proceed will be issued by Plant Engineering. No physical work by the contractor will commence until this notice is issued. The issuance of the Notice to Proceed is contingent upon receipt of all required bonds and insurance documents and approval of the contractor’s HASP.

### 7.7 Construction Safety Program Implementation

The CFN construction management program will follow the procedures set forth in The BNL SBMS Construction Safety Subject Area and the Plant Engineering Policies and Procedures related to construction safety.

### 7.8 Pre-construction Meeting

Plant Engineering will set up a Pre-Constriction Meeting with the contractor representatives, at which time the ESSH&Q issues, safety awareness issues, submittal procedures, and site organization procedures will be addressed. The Contractor’s Superintendents, Supervisors and Foreman are required to attend the Pre-Construction meeting. This agenda for this meeting will follow the requirements of EP Procedure E&CS 312 Pre-bid and Pre-construction meetings.

### 7.9 ESSH&Q Work Permit

Prior to physical construction, a work permit will be prepared which will identify anticipated hazards for the worksite, how these hazards will be controlled, who may be affected by these hazards and the personnel contact points related to this work activity are. This work permit will be posted at the job-site. This work permit is for general information and references the more detailed information of hazard analysis and methods of control contained in the contractor's HASP.

### 7.10 Contractor Vendor (CVO) Orientation

All subcontractors and tiered subcontractors are required to attend CVO training on their first day on-site as per Technical Specification 1.14. Training is provided on a daily basis at Building 422 between the hours of 8:30 and 10:30 AM. Upon completion of the training a card will be issued that must be signed by the Construction Inspection Group, Bldg, 650T and then processed by Safeguards and Security personnel at Building 30 to provide a photo Contractor Identification Badge.

### 7.11 Contractor Access and Badging

All Prime Contractor and Sub-contractor employees must attend Contractor/Vendor Orientation Training (see 7.3.4) and be approved by BNL in order to work on the BNL site per Technical Specification 1.13.

### 7.12 Heavy Equipment and Rigging Inspection Procedure

The CFN construction management program will follow the procedures set forth in EP-ESH-820B.

All hoisting and rigging activities will be covered under the SBMS Lifting Safety Subject area and the following EP procedures;

EP-ESH-701, Aerial Lift Safety

EP-ESH-702, Mobile Cranes-Boom Trucks

EP-ESH-706, Slings, Rigging Accessories, Lifting Devices

### 7.13 Schedule and Manpower Reporting

The BNL Field Engineer will prepare a daily Field report in accordance with EP E&CS 304 Daily Construction reports. These reports will indicate the nature of work conditions, tasks in progress, any issues or direction given, number and trade of contractor and subcontractor personnel on site. In addition, all contractors entering the BNL site will have their ID badges scanned when entering to verify that their badge is valid and to provide a record of their presence.

### 7.14 Weekly Construction Progress Meeting

Once construction activity approaches a level where it is deemed appropriate by the Conventional Construction Manager, there will be a weekly construction progress meeting among the contractor, his key subcontractors and the IPT. Construction safety status will be a standing agenda item at each meeting. Discussion will include a look ahead for planned near term activity to assure that appropriate safety controls will be provided as well as a review of the previous week's performance to identify areas for improvement or recognize and acknowledge excellent performance.

Meeting minutes will be prepared to document the discussion and will be distributed weekly to all attendees and CFN IPT members

### 7.15 Contractors' Schedule

When the contractor's schedule is approved, the approved copy will be distributed to the IPT members. The schedule will be used to identify planned dates for work activities and the corresponding hazard controls necessary to be in place for these activities. The schedule and near term work plans will be a standing agenda item at the weekly construction progress meeting.

### 7.16 Construction Safety Inspection

The CFN construction site will be inspected for ESSH&Q issues on a daily basis. These inspections will be documented using the procedure in Section 3 of the Construction Safety Subject Area and documented using the construction safety checklist and the following procedures:

EP-ESH-820, Contractor Safety Inspections
EP-ESH-820A, Safety Inspection Report

The RSB/CFN Construction Safety Engineer has the primary responsibility for these inspections. The ESH CSE will serve as the backup for the RSB/CFN CSE. Distribution of findings will be as per Figure 4.

### 7.17 Accident and Near Miss Investigation and Reporting

The CFN construction management program will follow the procedures set forth in The Investigation of Incident, Accidents and Injuries Subject Area and the Occurrence Reporting Subject Area.

In addition, in the event of any incident with the potential for lost work time or significant environmental impact, the Conventional Construction Design Manager will notify the Conventional Construction Manager, immediately advise the CFN Project Director, CFN Deputy Project Director and the ESSH&Q Coordinator. The CFN Deputy Project Director or his designee will initiate the call down list to assure that all required project staff are contacted. See **Figure 5** for reporting. The following EP procedure applies for reporting requirements:

EP-ESH-100, Investigations, Occurrences, Incidents.

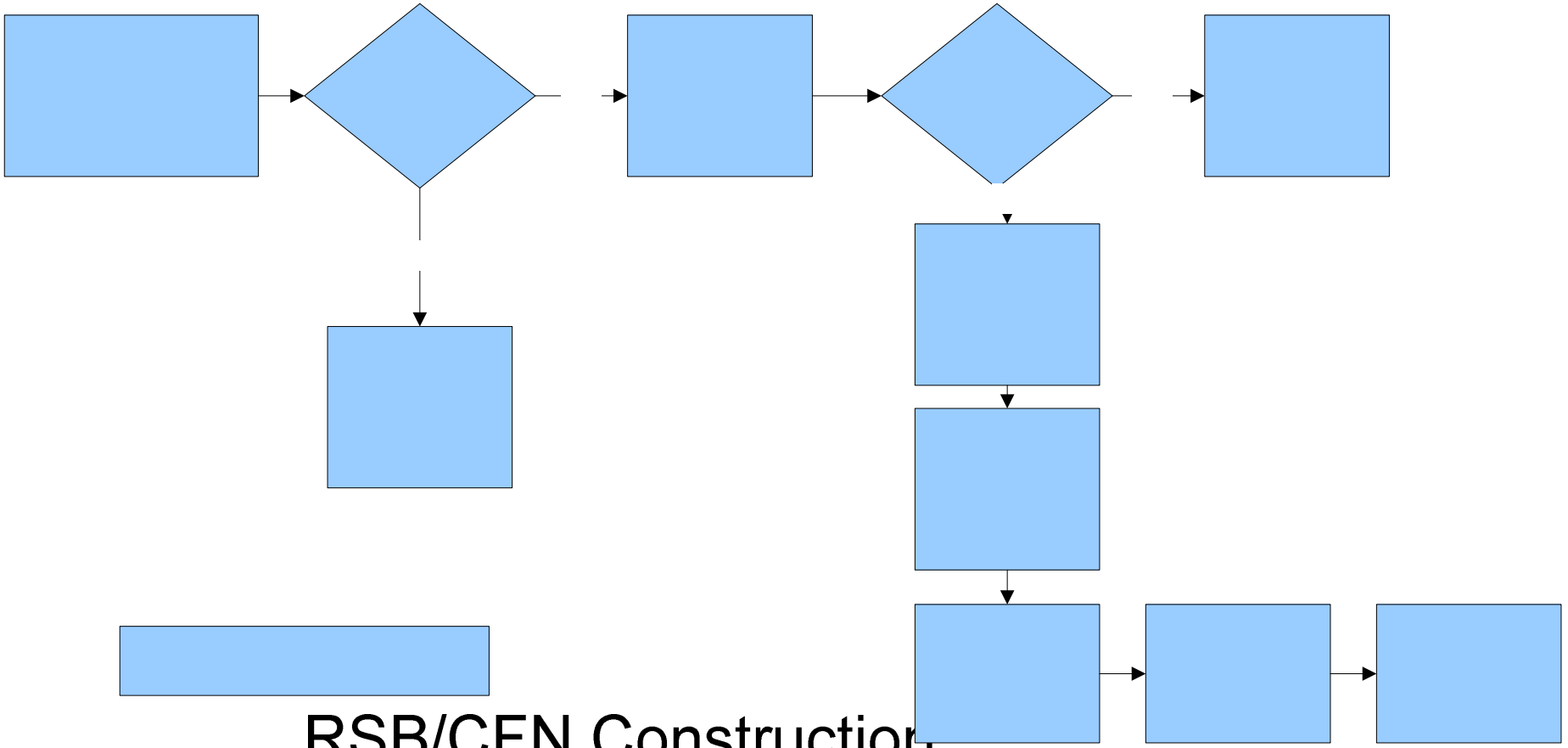
The following minimum criteria will be used for reporting to BHSO:

- Incidents likely to result in lost workday injuries or reportable environmental consequences

- Near misses deemed significant enough to have caused an injury or reportable environmental consequence
- Incidents reportable according to Occurrence Reporting and Processing System (ORPS) requirements
- Damage to equipment (BNL or Contractor) in excess of $5,000
- Findings and recommendations resulting from IO&A oversight activities
- Significant instances of contractor noncompliance observed during routine internal surveillance

### 7.18 Contractor Construction Safety Incentive

The CFN contract includes a construction safety incentive in the form of a maximum bonus of $100,000 payable to the contractor at the end of the project for excellent safety performance. The bonus will be reduced for each occurrence of a safety deficiency found during inspections and for any recordable, days away or other injury incident as indicated on Attachment 2. The amount payable under this bonus will be reduced on a per incident basis by the amounts indicted on Attachment 2. Occurrences that form the basis for a deduction from the bonus must be identified immediately to the Contractor Safety Representative and be documented by a member of the IPT in a daily construction safety report as indicated on **Figure 4**.



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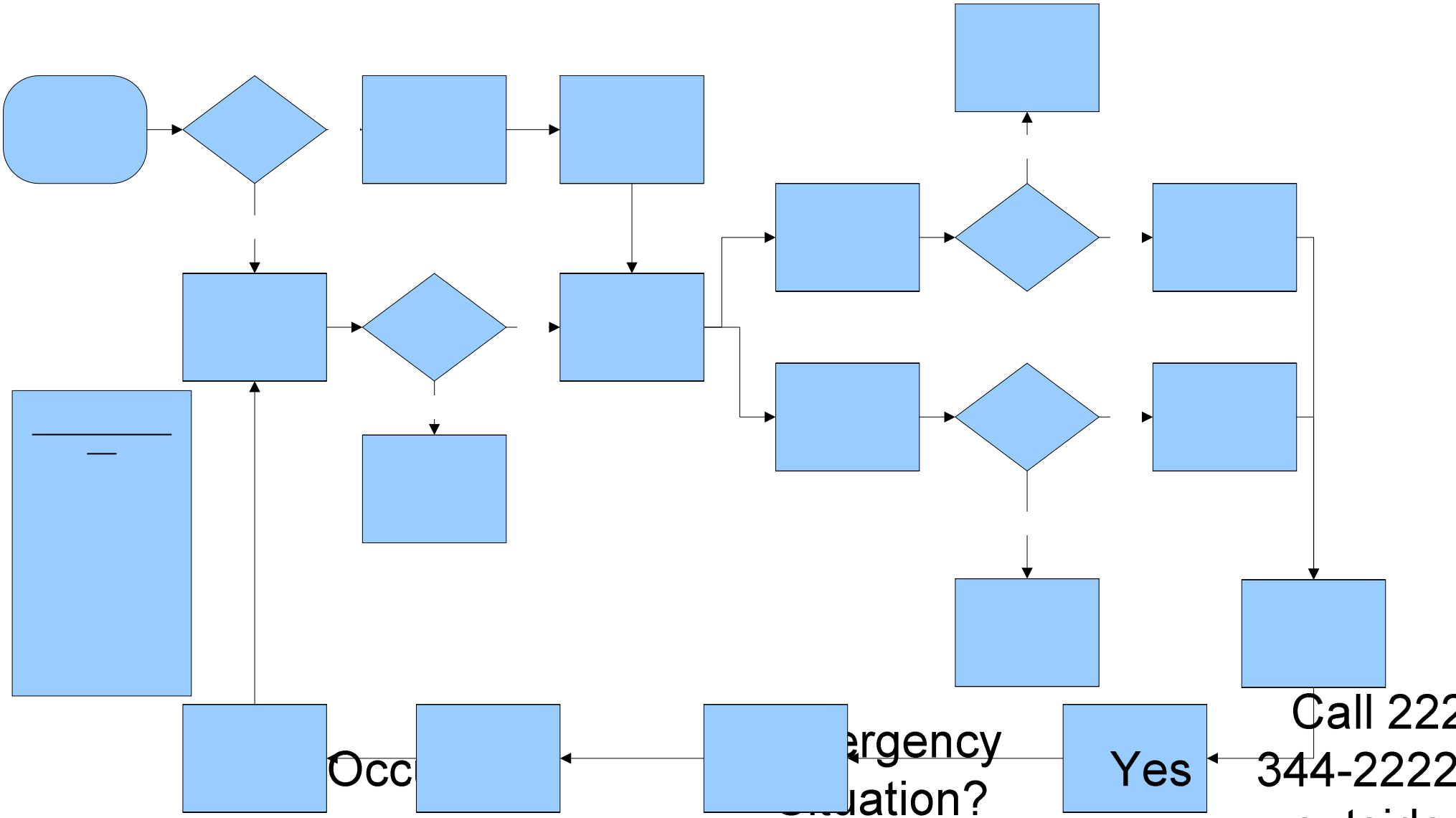
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### 7.19 Contractor Performance Measurement

In addition to the contractor construction safety incentive, the contractor's safety performance will be evaluated at the 50% and 100% complete phases of the project. This evaluation is in concert with other contractor performance evaluation factors as indicated under EP E&CS 310 Construction Contractor Evaluation. This evaluation is performed by the cognizant members of the IPT and provides a documented record of the contractor's performance for consideration in future award of contracts at BNL.

### 7.20 Final Inspection, Testing and Acceptance

Final inspection, testing and acceptance of construction will be performed in accordance with the project specifications and drawings and in accordance with Plant Engineering procedures. Building systems will be inspected and tested in accordance with the CFN Commissioning Plan prepared by BVH Consultants. BVH will prepare testing and inspection plans, verify contractor performance during installation, observe and verify test results and any retests, and provide a final commissioning report verifying readiness of building systems for operation. The CFN construction management program will follow the procedures set forth in the Operational Readiness Evaluation Subject Area in preparing the building, training maintenance staff, and preparing documentation needed to transfer responsibility for the CFN building from construction to operations.

### 7.21 Hazard Specific Safety Procedures

BNL and Plant Engineering have numerous hazard specific safety procedures that address requirements that are not specifically addressed by national consensus standards or that provide additional safeguards beyond consensus standards to meet the operational objectives contained in the BNL/DOE contract. These procedures include added precautions that enhance the protection of workers, the environment, and facilities at BNL. Among these procedures are procedures for:

- Digging Permits,
- Cutting and Welding and Burning Permits,
- Fall Protection,
- Scaffolding,
- Heat Stress,
- Confined Spaces,
- Personal Protective Equipment,
- Electrical Safety and Lockout/tagout,
- Stop Work, and
- Work Planning and Control.

### 7.22 Construction Site Security

Security of the CFN construction site will be maintained by the combination of the BNL site security program and the prime Contractor's obligations under the contract. BNL security will verify that all personnel entering the BNL site each day are authorized to do so. All contractor employees must prominently display their contractor identification badges at all times. BNL security staff will perform periodic surveillance of the site. The prime contractor is responsible for the behavior and actions of all prime contractor and subcontractor employees. The prime contractor is also responsible for maintaining, protecting and securing all materials delivered to the site. The contractor will also install a six foot chain link security fence around the construction site to maintain security and access control of the site. BNL will install a continuous live web camera for continuous video surveillance of the site. Although not principally intended for security purposes, all will be notified of the use of the web cam and it may serve to augment site security. All access to the construction site must be pre-approved by the PM 24 hours in advance. All visiting personnel to the site must be escorted by a member of the construction staff and don all appropriate personnel protection equipment as indicated by the escort.

## 7.23 CFN Construction Site Access

Only authorized personnel are permitted on the CFN construction site unescorted. The Conventional Construction Manager has the sole authority to determine the personnel that are authorized. This list will be maintained in the BNL CFN project trailer. All other visitors, guests, observers and tour groups must follow this procedure:

1. Visitors (including all un-authorized personnel, i.e., guests, oversight personnel, and tour groups) must pre-arrange their site visit through either:
    - Marty Fallier 344-3475
    - Ove Dyling 344-5297
    - Peter Boyle 344-2522
2. Visitors must enter the site via the West personnel gate off of Rochester Street. No visitor access is permitted via the South Contractor gate at Bell Ave.
3. All visitor parking is in the grass lot across Rochester Street from the visitor entrance gate.
4. Visitors must report directly to the CFN project trailer via the designated pathway.
5. Visitors must sign in at the CFN project trailer.
6. Visitors must don the following personnel protective equipment:
    a. Hardhat
    b. Safety Shoes
    c. Safety Glasses
    d. Reflective Vest (when heavy equipment is operating on site)
7. A safety briefing will be given by an authorized person at the time of sign in that assures that the visitor is cognizant of the hazards of the worksite, which areas are restricted etc.

8. Visitors must be escorted by an authorized person when not in the CFN project trailer or on the designated walkway to the trailer.
9. Visitors must sign out prior to leaving site and exit via the designated pathway to the Rochester Street gate.

## 8. REFERENCES


1. DOE Order 413.3, Program and Project Management for the Acquisition of Capital Assets
2. DOE Manual 413.3-1, Project Management for the Acquisition of Capital Assets
3. DOE Order 440.1A, Worker Protection Management for DOE Federal and Contractor Employees
4. DOE Guide 440.1-2, Construction Safety Management Guide for use with DOE Order 440.1
5. BNL Policy Manual
6. Environment, Safety and Health Manual – BNL
7. Construction Safety Subject Area – BNL
8. CFN Project Execution Plan
9. Excavation Safety Subject Area
10. Investigation of Incidents, Accidents and Injuries Subject Area
11. Occurrence Reporting Subject Area
12. Operational Readiness Evaluation Subject Area
13. Engineering Design Subject Area
14. Project Management Subject Area

# 9. APPENDIX

## 9.1 Appendix 1: Specific Qualifications of Key Personnel

### 9.1.1 CFN Project Director

*Minimum Qualifications:*

- Familiarity with managerial responsibilities described in BNL's *Integrated Safety Management (ISM) Program Description* and documents it incorporates by reference.
- Familiarity with environmental permit requirements and environmental protection plans listing in this plan's "Permits and Environmental Submittals".
- Familiarity with 29 CFR 1926, *Occupational Safety and Health Standards for the Construction Industry* and relevant portions of 29 CFR 1910, *Occupational Safety and Health Standards for General Industry*
- Familiarity with DOE Order 440.1A, Worker Protection Management for DOE federal and Contractor Employees,
- Familiarity with DOE Order 450.1, Environmental Protection Program,
- Considerable familiarity with the BNL Project Management SA.
- Considerable familiarity with the BNL Construction Safety Subject Area
- Considerable familiarity with the BNL Environment, Safety and Health Subject Areas

### 9.1.2 CFN Deputy Project Director

*Minimum Qualifications:*

- Familiarity with managerial responsibilities described in BNL's *Integrated Safety Management (ISM) Program Description* and documents it incorporates by reference.

- Familiarity with environmental permit requirements and environmental protection plans listing in this plan's "Permits and Environmental Submittals"*.*
- Familiarity with 29 CFR 1926, *Occupational Safety and Health Standards for the Construction Industry* and relevant portions of 29 CFR 1910, *Occupational Safety and Health Standards for General Industry*
- Familiarity with DOE Order 440.1A, Worker Protection Management for DOE federal and Contractor Employees,
- Familiarity with DOE Order 450.1, Environmental Protection Program,
- Considerable familiarity with the BNL Project Management SA.
- Completion of the 10 or 30-hour OSHA hazard recognition course for construction.
- Considerable familiarity with the BNL Construction Safety Subject Area
- Considerable familiarity with the BNL Environment, Safety and Health Subject Areas

### 9.1.3 ESSH&Q Coordinator

*Minimum Qualifications:*

- Professional accreditation as a Certified Safety Professional
- Familiarity with 29 CFR 1926, *Occupational Safety and Health Standards for the Construction Industry* and relevant portions of 29 CFR 1910, *Occupational Safety and Health Standards for General Industry*
- Familiarity with DOE Order 440.1A, Worker Protection Management for DOE federal and Contractor Employees,
- Familiarity with DOE Order 450.1, Environmental Protection Program,
- Considerable familiarity with the BNL Project Management SA.
- Completion of the 10 or 30-hour OSHA hazard recognition course for construction.

- Considerable familiarity with the BNL Construction Safety Subject Area
- Considerable familiarity with the BNL Environment, Safety and Health Subject Areas
- Field Construction Safety Experience

### 9.1.4 Conventional Construction Manager

*Minimum Qualifications:*

- Familiarity with managerial responsibilities described in BNL's *Integrated Safety Management (ISM) Program Description* and documents it incorporates by reference.
- Familiarity with environmental permit requirements and environmental protection plans listing in this plan's "Permits and Environmental Submittals"*.*
- Considerable familiarity with the portions of the *Environmental Assessment for Brookhaven National Laboratory,* pertaining to the CFN.
- Considerable familiarity with the *Construction Safety Subject Area.*
- Familiarity with DOE Order 413.3, *Program and Project Management for the Acquisition of Capital Assets,*
- Familiarity with 48 CFR 970.5204-2, *Integrating Environment, Safety and Health into Work Planning and Execution,*
- Familiarity with DOE Order 440.1A, *Worker Protection Management for DOE Federal and Contractor Employees,*
- Familiarity with DOE Order 450.1, *Environmental Protection Program,*
- Considerable familiarity with the BNL *Project Management Manual.*
- Completion of the 30-hour OSHA hazard recognition course for construction.
- At least three years experience in the management and supervision of engineering, construction and safety personnel.

### 9.1.5 RSB/CFN CSE

*Minimum Qualifications:*

- OSHA 30-hour Construction Safety Course (from an authorized OSHA Outreach provider)
- Completion of BNL Course HP-OHS-016, *Confined Space Entry*
- Completion of BNL Course TQ-Lead 1, *Lead in the Workplace (on-line course)*
- Completion of BNL Course HP-Q-006, *Contractor Vendor Orientation*
- Completion of BNL Course GE-*Fall Protection Training*
- Completion of BNL Course GE-Scaffold, Scaffold *Awareness Training*
- Completion of BNL Course TQ-TRENCHEX (OSH-301), *Excavation Competent Person Training*
- Three years experience conducting safety surveillance of commercial or heavy construction activities
- Familiarity with 29 CFR 1926, *Occupational Safety and Health Standards for the Construction Industry*
- Familiarity with BNL *Construction Safety Subject Area*
- Familiarity with environmental permit requirements and environmental protection plans listing in this plan's "Permits and Environmental Submittals" section (below).
- Familiarity with BNL SBMS and Environment*, Safety and Health Manual*

### 9.1.6 ESH CSE

*Minimum Qualifications:*

- Professional accreditation as a Certified Safety Professional or commensurate level of experience. OSHA 30-hour Construction Safety Course (from an authorized OSHA Outreach provider)

- OSHA 30-hour Construction Safety Course (from an authorized OSHA Outreach provider)
- Completion of BNL Course HP-OSH-016, *Confined Space Training*
- Completion of BNL Course 171, *Lead: Hazards and Controls Training*
- Completion of BNL Course GE-*Fall Protection Training*
- Completion of BNL Course GE-Scaffold, *Scaffold Awareness Training*
- Completion of BNL Course TQ-TRENCHEX (OSH-301), *Excavation Competent Person Training*
- Three years experience conducting safety surveillance of commercial or heavy construction activities
- Familiarity with environmental permit requirements and environmental protection plans listing in this plan's "Permits and Environmental Submittals" section (below).
- Familiarity with BNL SBMS and Environment*, Safety and Health Manual*
- Considerable familiarity with 29 CFR 1926, *Occupational Safety and Health Standards for the Construction Industry* and relevant portions of 29 CFR 1910, Occupational *Safety and Health Standards for General Industry*
- Considerable familiarity with BNL *Construction Safety Subject Area*

## 9.2 Appendix 2: Article 44 – Safety Incentive

The following does not enhance or diminish in any way either Brookhaven Science Associates (BSA) or the Contractor's rights under any other provisions of the contract. The following shall be considered last in the order of precedence. Incentives in this agreement are not an attempt at prior settlement of damages, either real or punitive. All parties reserve the right to recover all damages attributable to the other party, with no weight given to incentives paid or due.

### 9.2.1 Part I – Accident / Injury Rate

All recordable work related illnesses and injuries, as defined in 29CFR1904, Final Rule, the OSHA record keeping guidelines for Occupational Injuries and Illnesses, effective January 1, 2002, regardless of tier, that occur during the performance of this contract shall be reported as called for in BSA Specification 0700-1.25.

All work related illnesses and injuries shall be classified as either:

10. Recordable – Significant injury or illness diagnosed by a physician or other licensed health care professional even if it does not result in restricted work, job transfer or days away from work.
11. Recordable – Injury or illness that results in restricted work, job transfer or one or more days away from work.

Upon completion of the contract all accidents/injuries/illnesses shall be listed and classified based on the above classifications. Additionally, all OSHA violations (see schedule of OSHA 29CFR 1926 violations below) resulting from workplace inspections by BNL safety professionals shall be listed. The Safety Incentive shall be determined based on the following criteria.

The monetary incentive for this contract is one hundred thousand dollars **($100,000)**. The incentive shall be diminished by the following values:

1. Recordable – Significant injury or illness diagnosed by a physician or other licensed health care professional even if it does not result in restricted work, job transfer or days away from work - each case diminishes the incentive by one thousand dollars **($1,000)** (1.0% of the Safety incentive value).

2. Recordable – Injury or illness that results in restricted work, job transfer or one or more days away from work - each case diminishes the incentive by ten thousand dollars **($10,000)** (10 % of the Safety incentive value).

***A fatality, loss of limb or an injury to the head resulting in permanent disability, voids incentive under Part I of this agreement.***

3. OSHA Violations –each incident identified from the schedule of OSHA Violations below diminishes the incentive by one thousand dollars **($1,000)** (1.0% of the Safety incentive value).

### 9.2.2 Part II – Schedule of OSHA 29CFR1926 Violations

The following items have been selected for potential severity and ease of enforcement. It should not be inferred that the listed items are of greater importance than other ESSH&Q issues. The Contractor shall have the incentive value reduced by one thousand dollars **($1,000)** for each violation as described below.

(a) Fall Protection. Any worker not properly using appropriate fall protection systems constitutes a violation.

(b) Confined Space. Entry into a confined space without a required confined space permit or violation of permit requirements constitutes a violation.

(c) Lock-out Tag-out (LOTO). Failure to use when required, the LOTO procedures as approved in the Prime Contractor's Safety Plan constitutes a violation.

(d) Electrical. Any work on or near energized parts that violates BSA Specification 00800 1.10 F, or the Prime Contractor's Safety Plan, constitutes a violation.

(e) Failure to Report Injuries. Failure to report a recordable work related injury or illness as defined in 29CFR1904, constitutes a violation.

(f) Fire Protection. Failure to obtain a Burn Permit, required for welding or other hot work, or work performed without a fire watch and appropriate extinguisher constitutes a violation.

(g) Hidden Hazards. Excavation without a required Dig/Penetration Permit, or violation of the requirements of a Dig/Penetration Permit constitutes a violation.

(h) Shoring Hazards. All excavations shall be protected from cave-ins by adequate protection systems designed in accordance with 29CFR1926.652. Any infraction in conjunction with subpart "P" constitutes a violation.

(i) Personal Protective Equipment. Any worker not wearing personal protective equipment as required in the contract documentation or in the Prime Contractor's Safety Plan constitutes a violation.

(j) Failure to perform and document required "Tool Box" safety meetings pursuant to BSA specification 00800 1.10 Construction Safety.

The incentive is regarded as a mechanism for continuously emphasizing safety on this project. BNL daily safety inspections will be performed by BNL safety professionals. The basis for calculation of the incentive is described above.

Determination of final incentive amounts, owed to the Contractor, will be made within 30 days of cessation of all work under this contract. This determination shall be made by the BSA Contracting Representative upon review of submitted data from the Contractor and BNL Safety Professionals. The incentive amount owed to this Contractor, if any, will be added as a separate item to the final invoice by the Contractor.